In the Specification:

Please enter the following amended paragraph, which begins on page 1, line 15, of the Specification:

--Recently, liquid crystal display panels have been rated highly in the market, as they save ~~the~~ space ~~for their~~upon installation and save ~~the~~ power during~~for their~~ operation, and their applications are ~~much~~ expanding not only for displays ~~for~~ of portable computers and ~~for~~ monitors for portable televisions, but also for monitors ~~for~~of desk-top personal computers and ~~for~~ flat televisions ~~for~~in domestic use. The backlight unit for lighting the liquid crystal display surface of such a liquid crystal display panel from the back surface of the panel includes two types; one being a direct-light-type unit that comprises a diffuser, a cold-cathode tube and a reflector all disposed just below the back surface of a liquid crystal display panel, and the other being a sidelight-type unit that comprises a diffuser, an optical waveguide and a reflector all disposed just below the back surface of a liquid crystal display panel, in which a cold-cathode tube and a reflector having a C-shaped or rectangularly U-shaped cross section are disposed on ~~the~~ both sides of the optical waveguide.--

Please enter the following amended paragraph, which begins on page 2, line 8, of the Specification:

--For ~~down-sizing~~downsizing them and ~~for~~ saving ~~the~~ space ~~for their~~upon installation, the latter is preferred to the former. However, the luminance of the former direct-light-type unit could be easily increased merely by increasing the number of the

cold-cathode tubes in the unit, but it is difficult to increase the number of the cold-cathode tubes in the latter sidelight-type unit. It is therefore desired to increase the luminance of sidelight-type backlight units by increasing the emission efficiency of the units.--

Please enter the following amended paragraph, which begins on page 3, line 23, of the Specification:

--In addition, the cold-cathode tubes in the unit involve by themselves a factor to lower the emission efficiency of the unit. As in Fig. 38, for example, the light ~~having been~~ emitted from one point of a cold-cathode tube 108 is partly reflected on the outer surface of the glass tube 136. In a cold-cathode tube having, for example, an outer diameter of 2.6 mm and an inner diameter of 2.0 mm, the reflected light accounts for at least 30 % of the entire light emission from the tube. About 25 % of the reflected light having reached the inner surface of the glass tube (for example, on the point c and the point d in Fig. 38) will be absorbed by the phosphor 138 coated on the inner surface of the glass tube or by the mercury gas filled in the glass tube. In addition, when the light ~~having gone~~from ~~out of~~ the cold-cathode tube 108 enters the glass tube of the neighboring cold-cathode tube 106, about ~~25 %~~25% of the incident light ~~having reached~~ that reaches the inner surface of the glass tube (for example, on the point a and the point b in Fig. 38) will be absorbed by the phosphor 138 coated on the inner surface of the glass tube or by the mercury gas filled in the glass tube.--

Please enter the following amended paragraph, which begins on page 5, line 11, of the Specification:

--For increasing the luminance of the backlight unit, two cold-cathode tubes of 102 to 108 are disposed for each of the reflectors 110, 112, and the optical waveguide 100 therefore has two pairs of cold-cathode tubes on ~~its~~ both of its sides. The light ~~having been~~ emitted by the cold-cathode tubes 102 to 108 toward the optical waveguide 100 directly enters the optical waveguide 100 through its sides, and ~~runs inside it~~it is transmitted within the waveguide while being almost entirely reflected on and around it. The light emitted by the cold-cathode tubes 102 to 108 toward the reflectors 110, 112 is reflected by the reflectors 110, 112, and the thus-reflected light also enters the optical waveguide 100 through its sides and ~~runs inside~~is transmitted within it like the direct light ~~as~~ above.--

Please enter the following amended paragraph, which begins on page 5, line 24, of the Specification:

--~~Running~~ Passing through the optical waveguide, a part of the light L1 goes out toward the reflector 132 or toward the diffuser 130, and the light ~~having reached~~ that reaches the diffuser 130 passes through it while been diffused therethrough toward the liquid crystal panel 134. The light L2 ~~having reached~~ that reaches the reflector 132 is reflected by it, and then passes through the optical waveguide 100 to reach the diffuser 130. This is also diffused toward the liquid crystal panel 134. In ~~that~~this manner, the

liquid crystal panel 134 is illuminated by ~~the~~ light ~~thus having been~~ diffused ~~in these~~from two ~~routes~~paths.--

Please enter the following amended paragraph, which begins on page 6, line 4, of the Specification:

--To meet the recent requirement for high-luminance backlight units, ~~the structure~~structures having a plurality of cold-cathode tubes disposed ~~for~~ with one reflector ~~is being much popularized~~are popular. In many cases, the shape of the reflector is determined depending on the external structure of the lighting unit and on the electric circuit and the wiring mode for the unit, for example, as in Japanese Patent Laid-Open No. 274185/1997.--

Please enter the following amended paragraph, which begins on page 6, line 13, of the Specification:

--An outline of the structure of the light source unit for conventional, direct-light-type backlight units is described with reference to Fig. 41 and Fig. 43. The structure of the direct-light-type backlight unit differs from that of the sidelight-type backlight unit shown in Fig. 41 in that, in the former, a plurality of straight light source tubes such as cold-cathode tubes 102a to 102d or the like are disposed below the diffuser 130 to be a surface light-emitting member and they are covered with a reflector 110 around them, as in Fig. 43; while in the latter, the optical waveguide 100 is disposed below the diffuser 130 and the light source units are on ~~the~~ both sides of the optical waveguide 100, as in

Fig. 41. The direct-light-type backlight unit is so constituted that the light emitted by the cold-cathode tubes 102a to 102d therein is, either directly or after having been reflected by the reflector 110, uniformly diffused through the diffuser 130, and then applied to the liquid crystal panel disposed adjacent to the unit.--

Please enter the following amended paragraph, which begins on page 7, line 2, of the Specification:

--~~In~~For any of edge-light-type (sidelight-type) or direct-light-type backlight units, ~~used are~~ any of cold-cathode tubes 102, 102a to 102d, and 104 to 108 of the same type are used. The cold-cathode tube is made of a glass tube 136 with an electrode fixed on ~~its~~ both of its sides ~~side~~, and the inner surface of the glass tube 136 is coated with a phosphor 138. Mercury, argon and neon are sealed in the glass tube 136. For the glass tube 136, generally used is hard glass having a refractive index of 1.5 or so.--

Please enter the following amended paragraph, which begins on page 7, line 20, of the Specification:

--A conventional cold-cathode tube serving as a light source that receives essentially the fluorescence of the UV rays having been emitted through discharge emission of mercury or the like and emits visible light, for example, that for a light source for liquid crystal displays and others is described with reference to Fig. 44A and Fig. 44B. For the light source for liquid crystal displays, ~~used are~~ cold-cathode tubes coated with phosphors capable of emitting light of three primary colors are used. For ordinary cold-

cathode tubes, a phosphor mixture prepared by mixing $(SrCaBa)_5(PO_4)_3CL$:Eu, $LaPO_4$:Ce,Tb, Y_2O_3:Eu and the like in a predetermined ratio is baked on the inner surface of the glass tube 136, as in Fig. 44A. The phosphors are white translucent powders, and they are fixed on the inner surface of the cold-cathode tube generally via a binder consisting essentially of water glass. Cold-cathode tubes of that type, reflectors (essentially made of aluminium) to surround them, and a tabular optical waveguide (acrylic plate) are assembled into a backlight unit such as that shown in Fig. 37A and Fig. 37B, and the unit is disposed behind a liquid crystal panel.--

Please enter the following amended paragraph, which begins on page 10, line 8, of the Specification:

--In this structure, however, the part extending from the cold-cathode tubes 102, 104 to the optical waveguide 100 form a substantially continuous body. In this part, therefore, the optical waveguide 100 will lose the waveguide condition for it (the condition is that, in principle, all the light from the cold-cathode tubes entirely enters the optical waveguide 100 on its side surface at an incident angle larger than the critical angle thereto). ~~Concretely for this~~By way of example, a light source unit of Fig. 40 is referred to. In the case where the optical adhesive 122 and the transparent liquid 118 are not present in the unit, for example, the light from the cold-cathode tube 106 shall be refracted at one end of the optical waveguide 100 to run in the refracted direction of the dotted line P. With that, the thus-refracted light will run through the optical waveguide 100 while undergoing repeated total reflection therein. However, in case where the

refractive index of the members that form the optical path is unified by the optical adhesive 122 and the transparent liquid 118, the light from the cold-cathode tube could not be refracted but shall go straight ahead as in the solid line Q, and it will be out of the optical waveguide 100.--

Please enter the following amended paragraph, which begins on page 26, line 9, of the Specification:

--The backlight unit for liquid crystal displays and others of the first embodiment of the invention is described with reference to Fig. 1A through Fig. 5. This embodiment ~~is to~~ provides a backlight unit in which the emitted light is prevented from leaking out of the optical waveguide not undergoing total reflection, even when the light source unit therein is so constituted that the outer peripheral region of each cold-cathode tube therein is filled with a liquid of which the refractive index n1 is nearly the same as the refractive index n0 of the glass material that forms the outer wall of the cold-cathode tube.--

Please enter the following amended paragraph, which begins on page 28, line 6, of the Specification:

--An outline of the constitution of the backlight unit of this Example is described with reference to Fig. 1A and Fig. 1B. Like Fig. 37B, Fig. 1A and Fig. 1B are cross-sectional views of a backlight unit, especially clarifying the region around the light source unit of the backlight unit. Fig. 1A shows the driving principle of the backlight

unit; and Fig. 1B shows the ~~concrete~~ constitution thereof. The backlight unit ~~to be~~ in ~~actual~~ liquid crystal monitors (televisions) is provided with a prism sheet, a diffuser and other members between the unit and the liquid crystal panel adjacent thereto. However, such members have no specific relation to this embodiment of the invention, and their description is omitted herein. In the backlight unit, especially the cold-cathode tubes, the reflector and the optical waveguide are specifically described ~~for their constitution~~.--

Please enter the following amended paragraph, which begins on page 28, line 21, of the Specification:

--In order that the emitted light from the light source unit that comprises at least the housing 6, the cold-cathode tubes 2, 4, and the transparent liquid 8 can be ~~well~~properly guided by the optical waveguide 1 to ~~run~~pass through it, the incident angle of the emitted light to the side surface S (or S') of the optical waveguide 1 must be at least the critical angle thereto, as in Fig. 1A and Fig. 1B. For this~~, in this~~ Example, the profile of the light-reflecting surface of the reflector 10 that forms the inner surface of the housing 6 of the light source unit is modified to thereby control the going-out angle of the emitted light from the light-reflecting surface. In this Example, two cold-cathode tubes 2, 4 each having an outer diameter of 2.6 mm are packaged in the light source unit. The reflector 10 has a nearly rectangular cross-sectional profile formed by connecting the edges T-U-V-W, and this covers the cold-cathode tubes 2,4 while being spaced by a minimum distance 1 mm from the tubes 2,4, as in Fig. 1A.--

Please enter the following amended paragraph, which begins on page 30, line 23, of the Specification:

--When the incident angle of the light that reaches the light-emitting surface S (S') is designated by $\theta 3$ and when the light undergoes total reflection on the surface, then $n2\sin\theta 3 > 1$ according to the Snell's law. From Fig. 1A, $\theta 3 + \theta 4 = \pi\underline{\pi}/2$, $n2\sin\theta 4 > 1$, and $\theta 4 = |\theta 1 - \theta 2|$. Therefore, $n2\cos(|\theta 1 - \theta 2|) > 1$, and the above-mentioned formula is derived from this.--

Please enter the following amended paragraph, which begins on page 32, line 13, of the Specification:

--An outline of the constitution of the backlight unit of this Example is described with reference to Fig. 2. Additionally having a forced air-cooling mechanism, this Example is a modification of Example 1. Precisely, an axial fan 18 having a square size of 20 mm × 20 mm is provided behind the reflector 10 of a metal plate (e.g., aluminum plate) that forms the housing 6, and this applies flowing air onto the outer surface of the reflector 10. The axial fan 18 is provided with a revolution speed control mechanism 22. Based on the temperature of the transparent liquid 8, the revolution speed control mechanism 22 controls the revolution speed of the axial fan 18. The temperature of the transparent liquid 8 is monitored, for example, on the basis of the thermo-electromotive force difference between the ~~chromel~~cromel 20 embedded in a part of the reflector 10 and the aluminum material that forms the reflector 10. With the mechanism, the liquid temperature can be lowered by 10°C or so.--

Please enter the following amended paragraph, which begins on page 34, line 8, of the Specification:

--In the above-mentioned Examples, employed is the first method of making it possible to orient the emitted light so that the majority of the emitted light can be reflected on the light-emitting surface of the optical waveguide. In other words, the method employed in these examples comprises changing the angle of the emitted light in the previous stage before the light enters the optical waveguide so that the light is specifically oriented in the direction falling within the angle range that meets the optical waveguide condition. Being different from this, the second method is employed in the following Example 4, which is for reducing the degree of light emission from the region of the light-emitting surface of the optical waveguide nearer to the cold-cathode tubes.--

Please enter the following amended paragraph, which begins on page 34, line 22, of the Specification:

--An outline of the constitution of the backlight unit of this Example is described with reference to Fig. 4A to Fig. 4C. Fig. 4A is a view of the backlight unit of this Example seen on its emission side. Fig. 4B is a cross-sectional view of Fig. 4A cut along the line A-A. As illustrated, the backlight unit comprises an acrylic plate 1 (this serves as an optical waveguide) with a light-scattering pattern 114 formed on its back surface, and two cold-cathode tubes 2, 4 disposed nearly in parallel with each other on and along one side of the acrylic plate 1. A housing 6 having a reflector 10 (for this, an aluminum film is popularly used) on its inner surface is provided to surround the two

cold-cathode tubes 2, 4, and its one side is opened to the optical waveguide 1 facing thereto.--

Please enter the following amended paragraph, which begins on page 35, line 5, of the Specification:

--Also on and along the other side of the optical waveguide 1 having the two cold-cathode tubes 2, 4 disposed on its one side, other two cold-cathode tubes 2, 4 are disposed nearly in parallel with each other, and a housing 6 having reflector 10 on its inner surface is provided to surround the two cold-cathode tubes 2, 4 with its one side being opened to the optical waveguide 1 facing thereto. The reflector 10 of the housing 6 in this Example is formed to have a rectangular cross-sectional profile, ~~and this~~which is not convexedly curved ~~being~~and is different from that in Example 1. In this Example, the cold-cathode tubes 2, 4 (these may be the same as in Example 1) are so spaced from each other that the narrowest distance between them is 1 mm.--

Please enter the following amended paragraph, which begins on page 36, line 7, of the Specification:

--On the light-emitting surface, provided are a plurality of reflective silver dots 32. The reflective dots 32 are provided so as to make the light that will directly pass through the light-emitting surface of the optical waveguide 1, which is not undergoing total reflection, ~~goes~~go back into the optical waveguide 1. The ratio of the nude region

not coated with the reflective dots 32 shall be determined in the manner mentioned below.--

Please enter the following amended paragraph, which begins on page 48, line 7, of the Specification:

--This Example is another modification of Example 3. In this, the profile of the second optical waveguide 36 adjacent to the reflector is so modified that the interface between the second optical waveguide 36 and the neighboring air layer ensures total light reflection thereon. ~~Concretely~~That is, the interface between the second optical waveguide 36 (its refractive index is about 1.5) and the neighboring air layer (its refractive index is 1) enjoys total light reflection thereon when the incident angle thereto is at least 45°. Accordingly, not only the reflector 10 may be omitted in this unit but also ~~100 %~~100% reflection can be realized therein even with the reflector 10 having a reflectance of ~~95 %~~95% or so. Owing to such high reflection, the light emission efficiency of this unit can be increased.--

Please enter the following amended paragraph, which begins on page 90, line 9, of the Specification:

--As described hereinabove, the phosphor area can be enlarged to a satisfactory degree in this embodiment. Therefore, in this, the particle size and the density of the phosphor particles to be used and also the thickness of the phosphor layer to be formed can be optimized to thereby ~~surely~~ prolong the life of the light source unit and

increase the brightness of the unit. In addition, even when the emission tube used is down-sized to reduce the overall thickness of the display unit comprising it, the phosphor area can still be kept ~~still~~ large. Therefore, this embodiment realizes thin-walled display devices, not detracting from their brightness.--

Please enter the following amended paragraph, which begins on page 129, line 22, of the Specification:

--Example 7-3 of this embodiment is described with reference to Fig. 73. Fig. 73 is a cross-sectional view showing the outline of the lighting unit 401 of this Example, in which the lighting unit is disposed adjacent to the surface of the liquid crystal panel FP to be illuminated by it. In this, the same constituent elements as those in Examples 7-1 and 7-2 are designated by the same reference numerals, and describing them is omitted herein. The lighting unit 401 of this Example is similar to but partly differs from that of Example 7-1, and this is characterized in that the inclined parts 430, 432 as in Example 7-1 are disposed at the both ends of the parallel-plate substrate 406 of transparent acrylic resin. The both edges of the parallel-plate substrate 406 form light-entering surfaces SO, SO', and light sources 434, 434' are disposed to face the two light-entering surfaces SO, SO'. ~~Concretely~~That is, the light-entering surface SO on the left side in the drawing has the inclined parts 430, 432 and is equipped with the light source 434; and the light-entering surface SO' on the right side therein has the inclined parts 430', 432' and is equipped with the light source 434'.--

Please enter the following amended paragraph, which begins on page 133, line 4, of the Specification:

--One modification of this Example is described with reference to Fig. 77A to Fig. 77C. Fig. 77A is a plan view of the lighting unit of this Example, showing the optical waveguide 436 seen over the liquid crystal panel FP. Fig. 77B is a cross-sectional view of Fig. 77A, cut along the line A-A; and Fig. 77C is a cross-sectional view thereof, cut along the line B-B. The lighting unit 401 of this modification is similar to but partly differs from that of Example 7-4 illustrated in Fig. 74, and this is characterized in that the inclined structure is disposed at all the four edges of the parallel-plate substrate 406. In this, the inclined parts 430, 430' standing on the light-emitting surface of the parallel-plate substrate 406 are alternated with the inclined parts 432, 432' standing on the back surface thereof, in the peripheral region of the parallel-plate substrate 406. In ~~that~~this constitution, the inclined parts at the four edges of the optical waveguide 436 are prevented from overlapping with each other.--

Please enter the following amended paragraph, which begins on page 137, line 20, of the Specification:

--The fifth characteristic is that the visible light source comprises a phosphor layer and a UV source spaced from each other and that the surface thereof through which the visible light goes out of it is roughened. ~~Concretely~~That is, the visible light source comprising a phosphor layer and a UV source is so constituted that the visible light converted in the phosphor layer is taken out of it through one surface of the

phosphor layer and that the surface of the phosphor layer through which the visible light is taken out of it is roughened in accordance with the profile of the phosphor particles.--

Please enter the following amended paragraph, which begins on page 139, line 6, of the Specification:

--The phosphor layer 456 in this Example is formed in the manner mentioned below. First prepared is a coating liquid of phosphor. ~~Concretely~~That is, a mixture of phosphor particles 462 in 5 % by volume of a binder (water glass) 464 is dispersed in a solvent of 0.6 % by weight of ammonium polymethacrylate in water to prepare a coating liquid of phosphor. The coating liquid is applied to a quartz tube (inner tube 458) standing vertically, along its outer wall surface, then the resulting quartz tube is baked, and the phosphor layer 456 formed around it is dried with hot air.--